Trend Study 27-9-03

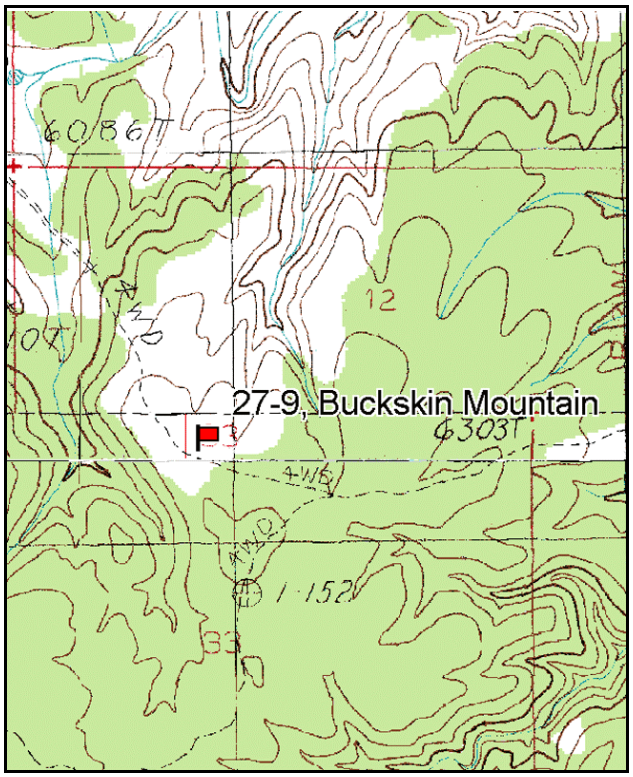
Study site name: Buckskin Mountain . Vegetation type: Basin Big Sagebrush .

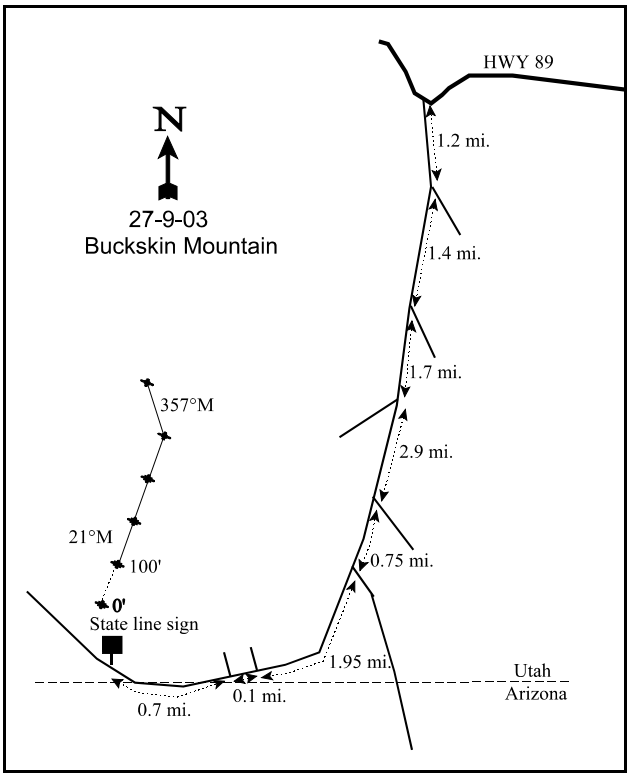
Compass bearing: frequency baseline 21 degrees magnetic. (Line 5 357°M).

Frequency belt placement: line 1 (11ft), line 2 (34ft), line 3 (59ft), line 4 (71ft), line 5 (95ft).

LOCATION DESCRIPTION

From Kanab, head east on U.S. 89 to mile marker 44. Go 0.6 miles south of the mile marker to a road on the right (BLM Rd. #730). Drive 1.2 miles to a fork on the right. Go right (main road) for 1.4 miles to a left turn (BLM Rd. #723). Go 1.7 miles to another fork and go straight (left). Drive 2.9 miles to another fork. Stay on the main road (right) for 0.75 miles to a fork. Go straight at the fork for 1.95 miles to another right fork. Go 0.1 miles to a right fork. Continue 0.7 miles to the Arizona\Utah border sign. From this sign, walk 50 feet at 326 degrees magnetic to the 0-foot stake. The study is marked by steel, green fenceposts approximately 12-18 inches in height.





Map name: Telegraph Flat

Diagrammatic Sketch

Township 44S , Range 3W , Section 12

GPS: NAD 27, UTM 12S 4095235 N, 403910 E

DISCUSSION

Buckskin Mountain - Trend Study No. 27-9

This study was established in 1997 and is located south of U.S. 89, west of Kaibab Gulch, and just south of Pine Hollow Canyon on the Utah-Arizona border. This site was established to better sample critical winter range south of the Vermillion Cliffs. It samples a low flat ridge which supports a cliffrose/juniper overstory with a basin big sagebrush/grass understory. The site slopes gently in a northerly direction at an elevation of about 6,300 feet. Deer frequent the site as evidenced by the high quadrat frequency of deer pellet groups in 1997 (49%) and 2003 (31%). Pellet group transect data was collected on site in 2003 and estimated 98 deer and 4 cow days use/acre (243 ddu/ha and 11 cdu/ha). A single elk pellet group was also sampled in 2003.

Soils at this site are very similar to those at Fivemile Mountain. Average effective rooting depth is estimated at almost 10 inches. Pavement and rock are abundant in the un-vegetated areas of the surface and throughout the soil profile. There is obviously no subsurface rooting barrier as evidenced by the dense stand of basin big sagebrush. Soil texture is a loam with a moderately alkaline pH (7.4). Soil temperature was high at 70°F in 2003 at a depth of 11 inches. Some erosion was noted in the isolated open areas, but vegetation and litter cover are adequate to prevent serious erosion. Bare ground was very low on the site at less than 10% in both readings.

The key browse on the site are basin big sagebrush and Stansbury cliffrose. Sagebrush accounted for 52% and 56% of the shrub cover in 1997 and 2003 respectively. Basin big sagebrush density was estimated at 2,920 plants/acre in 1997 decreasing to 2,180 in 2003. A slight increase in the number of dead sagebrush as well as a decrease in young plants accounted for the population decline. Although the number of young declined in 2003, recruitment would still be considered fair with 10% of the population consisting of young plants. Percent decadence was moderate in both 1997 and 2003 at 34% and 44% respectively. The number of decadent plants classified as dying declined from 45% (440 plants/acre) in 1997 to 27% (260 plants/acre) in 2003 which was an improvement. Most of the sagebrush displayed normal vigor in both surveys. Utilization was light to moderate with a few individuals receiving heavy use in 1997, but very little utilization was evident in 2003. Annual leaders on basin big sagebrush averaged 1.5 inches of growth in 2003.

Cliffrose density was estimated at 240 plants/acre and 360 plants/acre in 1997 and 2003 respectively. The available portions of cliffrose plants provided 28% and 18% of the browse cover in 1997 and 2003. These percentages are higher if the unavailable portions of cliffrose sampled by the line-intercept transect are factored in. This population is mostly mature with moderately low decadence. About half of the mature plants were partially unavailable to browsing in both surveys, resulting in mostly light to moderate use overall. Mature cliffrose average nearly 8 feet in height with overhead canopy cover averaging about 10% over the whole site in 1997 and 2003. Vigor has remained mostly normal throughout the cliffrose population, and reproduction is low. Cliffrose leaders had averaged 3.6 inches of annual growth when the site was read in early August of 2003. Broom snakeweed is present on the site with an average density of about 1,000 plants/acre, and pinyon and juniper trees had a combined density of about 140 trees/acre in 2003.

The herbaceous understory is very poor, and a discussion of perennial species is futile. A total of 9 perennial grasses and forbs were sampled on the transect during the 1997 and 2003 surveys, which provided less than ½ of 1% total cover during either reading. Cheatgrass dominates the understory as it provided 99% of the grass cover and half of the total vegetation cover in 1997 and 2003. With an average cover value of over 20% in both readings, the fire hazard created by cheatgrass is very high. A wildfire would be devastating to this important winter range as both basin big sagebrush and cliffrose are fire intolerant species. The abundance of cheatgrass also presents a severe competition problem for seedling and young shrubs, as well as perennial grasses and forbs, that will have a difficult time with establishment and survival in this system.

1997 APPARENT TREND ASSESSMENT

The soil trend appears stable with percent bare soil at only 6%. Vegetation and litter cover combined with the gentle terrain limit erosion. The browse trend appears down, primarily for sagebrush, however it provides the majority of the key browse forage (67%). The population of big sagebrush will likely decline due to the high percentage of decadent plants classified as dying at 45%. Another way to look at it is that another 440 plants/acre will be dead in the future. This will raise the percentage of dead plants in the population from 32% to 38%. However, seedlings and young could help to maintain the current population, but nothing is certain with these harsh conditions. The herbaceous understory is in extremely poor condition due to the lack of perennial grasses and the dominance of cheatgrass. In addition, forbs are rare in their occurrence on this site.

2003 TREND ASSESSMENT

Trend for soil is stable. Vegetation and litter cover are high, although the source for most of the surface vegetation and litter is cheatgrass. Bare ground remains low at 9% and erosion is minimal. Trend for browse is slightly down. Basin big sagebrush has a lower density estimate, increased decadence, and less young in the population. However, use is lighter compared to 1997 levels, and the proportion of the decadent age class classified as dying declined from 45% to 27%. Cliffrose showed a slight density increase, decadence remains quite low (17%), and the entire population had normal vigor in 2003. Although cliffrose reproduction is low, these plants are long lived and appear to be maintaining themselves at the present time. The herbaceous understory trend is slightly down and in very poor condition. Cheatgrass continues to dominate the understory although it significantly declined in nested frequency. Cheatgrass cover averaged over 20% in 2003 which creates a serious fire hazard to the key browse on the site. Perennial grasses and forbs are very rare and declined in sum of nested frequency.

TREND ASSESSMENT
soil - stable (3)
browse - slightly down (2)
herbaceous understory - slightly down (2)

HERBACEOUS TRENDS --
Management unit 27 , Study no: 9

Type	Species	Nested Frequency '97	Nested Frequency '03	Average Cover % '97	Average Cover % '03
G	Bouteloua gracilis	1	-	.00	-
G	Bromus tectorum (a)	[b]453	[a]368	25.61	20.39
G	Festuca ovina	7	1	.03	.00
G	Poa fendleriana	6	-	.21	-
G	Poa secunda	10	5	.01	.03
G	Sitanion hystrix	[b]26	[a]1	.10	.00
G	Vulpia octoflora (a)	[a]-	[b]38	-	.16
Total for Annual Grasses		453	406	25.61	20.55
Total for Perennial Grasses		50	7	0.35	0.03
Total for Grasses		503	413	25.96	20.59

Type	Species	Nested Frequency		Average Cover %	
		'97	'03	'97	'03
F	Calochortus nuttallii	6	-	.01	-
F	Descurainia pinnata (a)	-	5	-	.02
F	Draba spp. (a)	$_{a}$-	$_{b}$46	-	.27
F	Erodium cicutarium (a)	$_{a}$-	$_{b}$25	-	1.04
F	Erigeron spp.	6	-	.01	-
F	Gilia spp. (a)	$_{a}$11	$_{b}$138	.01	2.66
F	Holosteum umbellatum (a)	-	2	-	.00
F	Lappula occidentalis (a)	$_{a}$-	$_{b}$23	-	.11
F	Microsteris gracilis (a)	$_{a}$2	$_{b}$16	.00	.06
F	Phlox longifolia	5	-	.01	-
F	Plantago patagonica (a)	-	2	-	.00
F	Ranunculus testiculatus (a)	$_{a}$1	$_{b}$28	.00	.12
F	Sphaeralcea grossulariaefolia	1	10	.00	.01
F	Unknown forb-annual (a)	-	6	-	.04
Total for Annual Forbs		14	291	0.02	4.35
Total for Perennial Forbs		18	10	0.03	0.01
Total for Forbs		32	301	0.06	4.36

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Management unit 27 , Study no: 9

Type	Species	Strip Frequency		Average Cover %	
		'97	'03	'97	'03
B	Artemisia tridentata tridentata	76	65	12.19	8.77
B	Cowania mexicana stansburiana	9	10	6.55	2.82
B	Ephedra viridis	3	0	.06	.38
B	Gutierrezia sarothrae	27	15	1.08	.11
B	Juniperus osteosperma	7	5	3.57	3.43
B	Opuntia spp.	3	2	.00	.03
Total for Browse		125	97	23.48	15.56

CANOPY COVER, LINE INTERCEPT --
Management unit 27 , Study no: 9

Species	Percent Cover	
	'97	'03
Artemisia tridentata tridentata	-	7.31
Cowania mexicana stansburiana	10.80	8.36
Gutierrezia sarothrae	-	.06
Juniperus osteosperma	5.19	7.19

KEY BROWSE ANNUAL LEADER GROWTH --
Management unit 27 , Study no: 9

Species	Average leader growth (in)
	'03
Artemisia tridentata tridentata	1.5
Cowania mexicana stansburiana	3.6

POINT-QUARTER TREE DATA --
Management unit 27 , Study no: 9

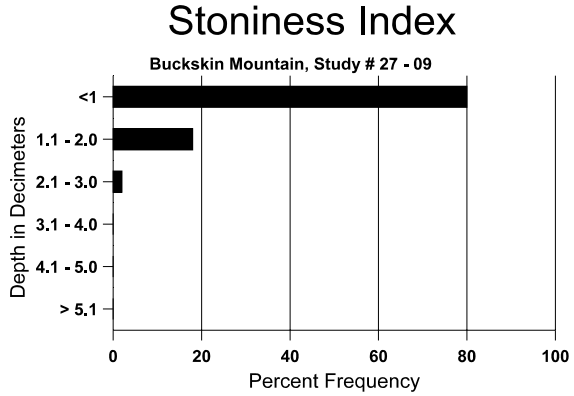
Species	Trees per Acre	Average diameter (in)
	'03	'03
Cowania mexicana stansburiana	61	10.2
Juniperus osteosperma	78	6.8

BASIC COVER --
Management unit 27 , Study no: 9

Cover Type	Average Cover %	
	'97	'03
Vegetation	38.47	37.72
Rock	4.40	5.34
Pavement	19.59	21.29
Litter	48.10	43.54
Cryptogams	.61	.04
Bare Ground	5.84	8.61

SOIL ANALYSIS DATA --
Management unit 27, Study no: 9, Study Name: Buckskin Mountain

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
9.8	70.0 (10.6)	7.4	41.7	32.7	25.6	2.6	25.7	121.6	0.4



PELLET GROUP DATA --
Management unit 27 , Study no: 9

Type	Quadrat Frequency '97	Quadrat Frequency '03	Days use per acre (ha) '03
Rabbit	24	14	-
Elk	5	1	1 (2)
Deer	49	31	98 (243)
Cattle	1	3	4 (11)

BROWSE CHARACTERISTICS --
Management unit 27 , Study no: 9

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Artemisia tridentata tridentata											
97	**2920**	640	740	1200	980	1360	30	9	34	15	29/37
03	**2180**	-	220	1000	960	1480	4	0	44	12	27/29
Cowania mexicana stansburiana											
97	**240**	20	20	180	40	-	17	0	17	8	94/95
03	**360**	-	20	280	60	-	6	17	17	0	93/97
Ephedra viridis											
97	**60**	-	-	60	-	-	0	0	-	0	28/30
03	**0**	-	-	-	-	-	0	0	-	0	35/47

		Age class distribution (plants per acre)					Utilization				
Year	Plants per Acre (excluding seedlings)	Seedling	Young	Mature	Decadent	Dead	% moderate	% heavy	% decadent	% poor vigor	Average Height Crown (in)
Gutierrezia sarothrae											
97	**1120**	-	60	960	100	520	0	0	9	9	8/11
03	**860**	400	440	420	-	40	0	0	0	0	6/7
Juniperus osteosperma											
97	**140**	-	20	120	-	-	0	0	-	0	-/-
03	**100**	-	-	100	-	-	0	0	-	0	-/-
Opuntia spp.											
97	**80**	-	40	40	-	20	0	0	-	0	6/15
03	**40**	-	-	40	-	-	0	0	-	0	6/18
Opuntia whipplei											
97	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	15/23
Pediocactus simpsonii											
97	**0**	-	-	-	-	-	0	0	-	0	-/-
03	**0**	-	-	-	-	-	0	0	-	0	7/24
Yucca spp.											
97	**0**	-	-	-	-	-	0	0	-	0	24/34
03	**0**	-	-	-	-	-	0	0	-	0	30/40